

Featured Stories



JPL Toastmasters Tame the Butterflies

By Vincent Robbins

In 2018, EMIT Project Manager Charlene Ung’s nephew, a budding engineer himself, asked her for career advice. When she searched her memory for professional challenges and insights from her 30-year career, a more extracurricular-leaning piece of advice came to mind.

When Ung began her career as a power systems engineer at Rockwell International, a mentor brought her to a Toastmasters meeting – the nearly-century-old, internationally-established public speaking and leadership club.

“My mentor said if you think you’re good at [public speaking] and you don’t have butterflies, that’s wrong,” Ung recalls. “Even actors have butterflies – and we’re not actors, we’re engineers.”

She participated in the club for several years and, over a decade later when Ung started at JPL, she found that the organization had a long-standing tradition on Lab: the JPL/Caltech Toastmasters club was chartered in 1968 by Alvin Richardson during his 31-year JPL career.

But that storied history was almost curtailed after the Lab's Toastmasters club, like many other in-person activities, limped out of nearly three years of remote work.



Preserving a Tradition

Without a regular place to meet, and lacking its pre-pandemic momentum, the club was on the verge of disappearing altogether in 2023. Around this time, Ung had lunch with JPLers Dankai Liu, Drew Meyers, and Ruzanna Yeranosyan to talk about the fate of the club.

“This JPL/Caltech club has been around for almost 60 years. I told them that we have to do it for the next generation,” Ung recalls. “I don't want to have it die on my watch.”

Ung's passion for reviving the group resulted in a defacto nomination as the next club president. With the help of the core members, Ung secured a meeting room in 167-151 and put the club meeting on the books for every other Wednesday night.

A recent meeting was lively, with over a dozen people participating, but Ung hopes that the momentum and membership continue to build.

A typical Toastmasters meeting looks like this: The “Toastmaster” of the evening leads the meeting, which consists of informal, impromptu “table topic” speeches, feedback sessions, and longer, prepared speeches. Like all chapters worldwide, JPL's club follows a charmingly old-fashioned etiquette and procedure — complete with handshakes, officer roles such as the Sergeant at Arms, and formalities like “thank you Madame Toastmaster.”

The goal of the weekly two-hour sessions is to provide all participants, both in-person and online, the opportunity to shake off nerves and speak in front of colleagues in a constructive, encouraging environment — and, over time, become confident and articulate speakers in a room of any size.

“It doesn't matter if you're an engineer, if you're a business person, I hope saving the club will provide an opportunity for young [JPLers] to come and practice and to be better,” Ung says. “It's a commitment to come right after work, but you don't have to drive anywhere, you walk to the conference room and here you are and you're in this friendly environment.”

Engineers, Not Actors

After all these years, Ung knows firsthand that the skillset of public speaking — and the training that Toastmasters provides — is especially helpful at a place like JPL.

“Some engineers don't really like to talk in public. Some people can even be afraid of speaking in a small group,” Ung says. “But when you do a presentation, when you do a technical review, you're presenting the idea of your design and people question it. If you can defend or [respond to] whatever questions they have — that's helpful.”

Such was the case for Systems Engineer Bob Gounley, who joined the JPL/Caltech Toastmasters club in 1982.

“My job as a systems engineer required a lot of speaking to upper management to let them know what the effects were of various changes, and somehow capture that information in a clear, comprehensible way that did not rely exclusively on view graphs with little bullet points,” says Gounley. “And it was important to be able to fill in the blanks with some kind of occasionally spontaneous explanation with a room full of people [who were] just ready to grasp at you and say ‘that's not right.’”



TALK TITLISTS — JPL/Caltech Toastmasters members won recent Area D-1 “International (Serious) and Tall Tale Speech Contest” honors. New Toastmaster Bob Gounley, right, took second place with his “tall tale”, “The Last Time I Saw Paris.” Dr. Dusan Petrac, CTM, left, captured first in the serious speech category with his “I Am Ready for a Major Overhaul”. A club past president, Dusan now goes to the Division B competition, the next contest level. Al Richardson, DTM, and club advisor, presents their awards. For information about the club, contact Don Heller, Ext. 6490. Photo by Tom Wynne, PhotoLab

With the skills he honed in Toastmasters, Gounley would go on to participate in public outreach for JPL over the course of his four-plus-decade career at JPL, even giving a talk about Galileo in front of hundreds of people at the Fleet Science Center in San Diego.



Left to right: JPL Toastmasters Charlene Ung, Bob Gounley, Dankai Liu, and Linet Davidian pose with one of Gounley's Toastmasters trophies from the '80s.

As for Ung, having gone from an engineer, to group supervisor, to section manager, and finally to project manager, she also feels that the skills honed in Toastmasters have translated beyond technical presentations and have supported her career growth.

“When I became a project manager and I had to go to NASA headquarters, I had to present to JPL executives, I had to communicate to my team, and in the all-hands to all the people who supported the project — I could see where I fell short,” Ung says. “I felt like I needed more practice.”

With the club revived, Ung realized that membership wasn’t the only thing that lost a little steam from two years without much in-person interaction.

“The first time we came back to this in person, standing up front, looking at everybody, it was just like your first time — the nervousness comes back again,” Ung says. “It’s the same people, it’s the same thing, it’s just the fright of being up there, being judged, being not good enough.”

Ung’s mentor was right — the butterflies don’t go away. But she recalls the question he posed in light of that realization: “How do you channel your butterflies and have them fly in formation?”

For Ung, the answer is showing up every other week and feeling those nerves.



*The Pioneer Station (DSS-11), a 26-meter polar-mounted antenna was the first deep space antenna to be constructed at Goldstone. Completed in 1958 in time to support the Pioneer 3 mission, DSS-11 became the prototype antenna for the Deep Space Network. **Image Credit: NASA/JPL-Caltech***

Origins of the Deep Space Network

By Erik Conway

Dec. 24, 2023 marks the 60th anniversary of the formation of NASA's Deep Space Network.

The name itself is somewhat older. It had been in use informally for a number of years to refer to the combination of JPL's Deep Space Information Facilities, the communications lines connecting them to JPL (which belonged to the then-new Goddard Space Flight Center), and the network control center then nearing completion at JPL, the Space Flight Operations Facility.

The renaming in 1963 represented the end of a somewhat ad hoc period of telecommunications development in the midst of rapidly changing institutional arrangements. The basic technology employed by JPL for its early space missions, the phase locked loop, dated to 1952. It had been developed to serve as a tracking filter for the Corporal missile. It was improved to handle very low power signals by Eberhart Rechtin and Walter Victor at JPL, and became a key component of JPL's CODORAC guidance system for the Sergeant missile.

The Army hadn't wanted CODORAC for Sergeant, though, and instead, elements of the system had been re-employed in the Jupiter ballistic missile program. For the Re-Entry Test Vehicle flights, JPL had placed ground stations in Florida and on the island of Grand Turk. Known as "Microlock," these stations were based on CODORAC and were also portable. They were moved to various other sites for a few years before permanent sites were chosen and built.

Microlock was not the only tracking system used for the Explorers, though. The Naval Research Laboratory developed a ground system called Minitrack that was the official tracking network for the International Geophysical Year satellite program. Because the tracking and engineering telemetry functions within the Jupiter missiles and Explorer satellites used Microlock, the Minitrack ground stations were hybrids, using elements of both systems. After NASA was created, Minitrack became the basis of

NASA's Earth orbit telecommunications infrastructure, which was called STADAN (Spaceflight Tracking and Data Acquisition Network).

For a brief period in the key year 1958, a new player steered interplanetary telecommunications development. A few days after the launch of Explorer 1 on January 31, 1958, but before the creation of NASA late the same year, President Eisenhower had created the Advanced Research Projects Agency (ARPA). ARPA funded a new set of out-of-Earth orbit missions, the Pioneers, and it had assigned JPL the task of studying what an appropriate telecommunications network for these future deep space missions would look like. The result of this study was ARPA's Tracking and Communications (Extraterrestrial) network, or TRACE. It was also known as World Net.

According to JPLer Nicholas Renzetti, who became chief of the Communications Engineering and Operations section in 1960, World Net was also sometimes referred to as the Deep Space Network even in 1958.



The Microlock station in Mayaguez, Puerto Rico, in 1958. Image Credit: JPL/Caltech

It's during the brief World Net period that JPL and ARPA chose Goldstone as the permanent North American station, and the famous Pioneer antenna (DSS-11) was built at the site. JPL's studies for ARPA in 1958 also suggested that stations located in Spain and South or Central Australia would make the most orbits available to future deep space missions, though it took a number of years to select specific locations and make the necessary diplomatic arrangements to establish those sites.

After NASA formed in October 1958, JPL's ground stations received the name Deep Space Information Facilities (DSIF). At JPL, there was not yet a permanent network control facility; instead, each project set up its own control center. Missions were short lived and their operational phases did not overlap. So there

was little impetus to drive an effort towards a permanent, standalone organization to serve many missions operating simultaneously.

That impetus, according to Eberhart Rechtin, who JPL Director William Pickering made the first Assistant Laboratory Director for Tracking and Data Acquisition at JPL in October 1963, came from William Giberson. He was the manager of the Surveyor lunar lander program. Unlike JPL's Ranger and Mariner spacecraft, which used pre-loaded command sequences much as JPL does now, the Surveyors were to be controlled on the lunar surface in real time. They needed considerably more ground infrastructure—and space to put it in—than the Rangers did. Surveyors were also expected to operate at the same time Langley Research Center's Lunar Orbiters and JPL's Mariners were, so scheduling of network time would also become necessary.



Celebrating the success of Ranger 7 in 1964 at the Goldstone DSN station. Left to right: Deputy Director Alvin Luedecke, Director William Pickering, Assistant Lab Director Robert Parks, and Ranger project manager Harris "Bud" Schurmeier. Image Credit: JPL/Caltech

The Surveyor program bore the initial cost of developing JPL's Space Flight Operations Facility (Building 230), and organizationally, it was located in Division 31, the Systems Division, while the DSIF belonged to Division 33, the Telecommunications Division. But as it became apparent to JPL and NASA leadership that both the new SFOF and the existing DSIF needed to begin operating independently of any specific project, Rechtin launch discussions with officials in NASA's Office of Space Science and Applications,

which funded the missions, and Office of Telecommunications and Data Acquisition, which funded the infrastructure, about how to organize and fund a mission-independent infrastructure. These discussions included the communications links between the DSIF stations and JPL because Rehtin thought the entire system should have a single leader, and therefore point of accountability.

Rehtin explained in a 1967 interview that he intended the new entity to be run as a “central core with mission independent peripheral areas which were assigned to the projects and within which they could do pretty much as they pleased.”

The ultimate agreement, announced at JPL in October 1963, had JPL establish a new Office of Tracking and Data Acquisition (mirroring NASA’s own terminology) at the Directorate level, with Rehtin as its head. A JPLer named William Bayley became the first General Manager of the Deep Space Network. The DSIF and SFOF were moved into that organization. NASA shifted the communications lines to JPL late in 1963, too, completing the basic shape of the network.

“Effective immediately, the Deep Space Network is established by combining the Deep Space Instrumentation Facility, Interstation Communications, and the mission-Independent portion of the Space Flight Operations Facility,” Pickering wrote in his Dec. 24, 1963 interoffice memo.

Rehtin commented later that he didn’t know why the labels DSIF and DSN had both been hung on NASA’s deep space communications infrastructure by NASA. NASA officials had used the names interchangeably in Congressional testimony, even though prior to December 1963, no such thing as DSN had existed. “If you look into the Congressional Record,” he said, “you will find DSN pretty commonly before this formal amalgamation of the various parts.”

Pickering probably wrote his memo in part to clarify the issue of names—DSN became used for the ‘amalgamation,’ as Rehtin put it, while for many years the term DSIF continued to be used to refer to the DSN’s major ground stations. The last use of DSIF in JPL’s employee newspaper, the Lab-Oratory, was in 1973.





NEBULA members (left to right): Kelly Luis, Lauren Denson, Aaron Yazzie, and Lanie James.

The Past, Present, and Future of the Arroyo’s Native Communities

By Vincent Robbins

In 2016, Dr. Gary Stickel observed something peculiar while doing preservation work at Big Rock, a large boulder in the Angeles National Forest known for its preserved Indigenous pictographic art.

Stickel, a tribal archaeologist who has worked extensively with the Gabrieleño Band of Mission Indians/Kizh Nation, discovered a small, stone-carved, gear-shaped hole that matched a type of Indigenous carving known as a “cogstone” or “sunstone.” These artifacts sometimes include an attached wooden shaft, known as a sunstaff, that is thought to have been used in sacred seasonal ritual ceremonies. Stickel had a hunch: a sunstick on Big Rock may have been used as a sundial to mark the summer and winter solstice.



Dr. Stickel examines a map of Kizh Nation sites that he developed over the last two decades of archaeological work with the tribe.

To test their theory, Stickel, his team, and a few tribal representatives returned with a replica sunstaff before sunrise on the winter solstice of 2021. When the first shaft of sunshine broke over the mountains and a ray of light landed on the smooth, damp surface of the stone, the shadow of the replica sunstick perfectly bisected the column of light. Big Rock had to have been an astronomical site. The discovery was so stunning that the anthropology magazine *Sapiens* even [compared Big Rock to Stonehenge](#).

“We were amazed,” Stickel says. “I didn’t know how the light was going to shine onto the boulder, but it did in a spectacular manner.”

Stickel’s discovery meant that centuries before JPLers probed and observed the outer reaches of our solar system and the universe, other peoples of these same mountains had long been studying the cosmos.

“We were the original scientists on this land,” says Quality Assurance Engineer and Group Supervisor Lauren Denson, co-chair of the Employee Resource Group NEBULA (Native Engagement in Building a Unified Leadership Alliance). “That’s what the elders say.”

JPL’s Origin Story

Systems Engineer and NEBULA Co-Chair Aaron Yazzie says that “origin stories” are an important part of the mythology and spirituality of his tribe, the Diné (Navajo).

“Here’s the story about how the constellations came into the sky,” Yazzie says. “Here’s a story about how this important mountain came to look the way it did. Here’s the way that our own people came into this world — there are traditional stories that deal with these.”



In a recent PBS series, Yazzie reflects on how Indigenous knowledge set the foundation for his work at JPL. Photo credit: PBS.

As an institution that inspires humanity with its future-facing spirit of daring mighty things, JPL's origin story is in some ways uncomfortable. Not only were its initial projects oriented around military weapons technologies, but the Laboratory is physically rooted on land where Native Americans were forcibly removed from their villages and conscripted into slave labor in the 18th and 19th centuries. It is becoming increasingly common, especially for institutions like JPL, to acknowledge these fraught historical contexts.

Thanks to NEBULA, the Office of Inclusion website now includes a land acknowledgment statement affirming and recognizing the Indigenous peoples of the Lab's land. While land acknowledgments may not address all of the issues that many Indigenous communities face — including housing, employment, generational poverty, healthcare, etc. — the members of NEBULA say they are a start.

A [NEBULA presentation](#) explains how these statements begin to acknowledge the history and violence that were largely erased; they encourage people to consider the privileges they may enjoy as a result of exploitative colonialism; and they honor our Indigenous colleagues who continue to fight for recognition both within and outside of our institutions.

“One of the first things we can do is just straight up recognize,” says Denson, who is of the Chihene Ndé (Warm Springs Apache) Nation of New Mexico. “It's complicated and it's messy and it's not the best history — but we should acknowledge it, just like they did with the Founders' plaque.”

In NEBULA, JPL has a community of Indigenous people representing different areas of “Turtle Island” — an Indigenous name for North America, including Native Alaska, Native American, and Native Hawaiian — as well as other Indigenous communities around the world. Along with their allies, NEBULA has worked hard to build awareness at JPL around Indigenous issues and strengthen support, mentorship, networking, and outreach within Indigenous communities.

“JPL is a special place where amazing things happen — we want people to feel good about working here, and we also have a complex, nuanced history,” says Employer Brand Communications Lead and NEBULA member Lanie James who is of the Muscogee Nation. “The best way to respect the past is to know it, do right by it going forward, and know that the institution is committed to that.”

In learning about, remembering, and doing right by the Native communities that inhabited this land before the Lab, the origin story of JPL becomes more whole.

Recognizing the Past

What is now California has been populated for thousands of years — most experts think between 10,000–15,000 years, while [one study suggests as far back as 130,000 years](#) — by hundreds of regional tribes whose communities shared gradations of similarities but also distinct cultural identities and languages. As many as 300,000 people lived in present-day California prior to the arrival of Europeans in the 16th century. The vast mountain ranges of the west coast led to a population that bore little physical, cultural, or linguistic resemblance to the Indigenous tribes of the Great Plains to the east and modern-day Mexico to the south.

In the Los Angeles basin, Indigenous villages thrived from the desert valleys to the mountains to the seas, and even on the islands — Santa Catalina, San Clemente, San Nicolas, and the Channel Islands.

The Kizh people identified themselves by the names of the villages they resided in — names that are still recognizable in the southland, like Topanga, Cahuenga, Tujunga, Cucamonga, etc. The Laboratory itself, as we know from our local watershed park, was nearest to the village of Hahamongna.

“Hahamongna was a village,” Stickel says. “All of these places that end in ‘nga’ like Cahuenga, Topanga, Cucamonga — even Azusa, which is derived from the Kizh Asuksa-nga — are villages. It’s a suffix meaning ‘place of.’ So, for example, Topanga is the place where the mountains run out to the sea.”

The Hahamongna territory wasn’t limited to the Arroyo — possibly encompassing present-day Altadena, the San Rafael Hills, and even parts of Glendale.



The modern-day area around Lab was home to the Hahamongna village. Photo credit: PhotoLab.

The temperate climate and plentiful food sources of the region allowed Kizh communities to thrive primarily through sophisticated forest gardening, controlled fire ecology, and permaculture — harvesting

and processing wild nuts, fruits, and vegetables, and capturing fish in streams and the ocean. The acorn, an abundant and calorie-dense seed of the native Californian oak trees, was a staple ingredient of the diet of most tribes throughout California.

In the 18th century, the Spanish began constructing religious outposts called missions from Southern to Northern California. To construct the mission system, Spanish explorers, government administrators, and religious missionaries conscripted Indigenous peoples into forced labor. Decimated by disease, malnutrition, and slave labor, the populations of the Indigenous tribes dwindled.

The California Gold Rush, which brought hundreds of thousands of immigrants from across the globe, further accelerated the displacement and depopulation of Indigenous societies – in just two decades, as many as 80% of California’s Native Americans were wiped out by disease, poverty, slavery, and even government-sanctioned genocide.

Throughout the 20th century, Indigenous communities in California struggled for survival and recognition. Thanks to the efforts of tribal activists and the work of a handful of Indigenous and non-Indigenous scholars, some knowledge, practices, and cultural traditions maintained continuity or were at least preserved in the historical record. It is from these surviving threads that the Indigenous communities of California today continue to practice and celebrate the spiritual and cultural traditions of their ancestors.

The California legislature officially recognized the Gabrieleño Band of Mission Indians in 1994, and the county of Los Angeles, the city of Los Angeles, and cities of San Gabriel Valley have since issued similar official recognitions. In the last few decades, the local governments, educational institutions, and tribal organizations have organized efforts to install monuments, rename public sites, sponsor artwork, and establish tribal cultural centers throughout Los Angeles County.

Facing the Future

While acknowledging – and learning about – history is an important part of grappling with a complicated past, Yazzie says they aren’t enough.

“If you just make a blank land acknowledgment, it means nothing – it’s just saying words,” he says. “You’ve got to continuously try to engage and to interact with the community.”

Since officially gaining recognition in 2020, NEBULA has been busy hosting events, participating in panels, running an active Slack channel, and attending gatherings like the American Indian Science and Engineering Society conference – “Aaron is the Taylor Swift of AISES,” says Denson. Denson says NEBULA has also been in touch with Environmental Assurance Organizations to think about how to more thoughtfully steward the land and has also worked with the JPL Green Club on efforts to learn about Indigenous knowledge of the flora of the area. And NEBULA efforts are not just within JPL – the group is also connected to the Native ERGs across NASA as one “Natives@NASA” community, that support each other and collaborate on widening the applicant pool of young Indigenous scientists and engineers and ensuring a safe and welcoming place for all Indigenous people.



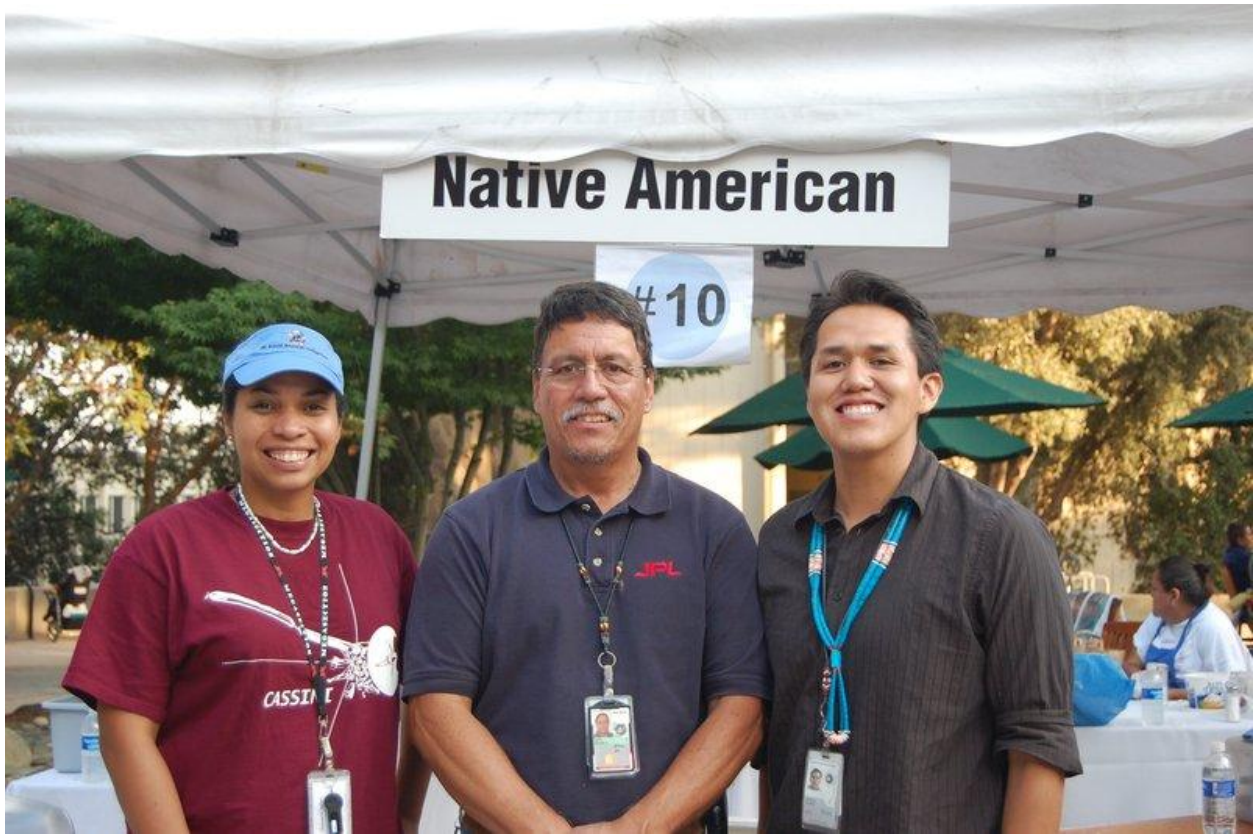
JPLers at the American Indian Science and Engineering Society conference pose with a cardboard cut-out of Yazzie – “the Taylor Swift of AISES.”

“Folks are starting to associate our little group – because we’re still a little group – with doing Indigenous initiatives and doing things in a good way,” Denson says.

But Yazzie and Denson both stressed that the work still falls on too few shoulders.

“I think the big word I’m going for is ‘representation,’” Yazzie says. “Bringing in more Natives through the pipeline to get them working at JPL. So it’s not just the few of us doing all the work.”

Yazzie recalls coming to Lab 15 years ago and meeting a few Native American JPLers; there was an affinity group but no officially recognized ERG. Since NEBULA was founded, the number of Indigenous interns nearly doubled in the last year – this year, they helped support five Aboriginal students participating in a four-month internship at JPL through the Australian Space Agency’s National Indigenous Space Academy. NEBULA estimates there are 40 or so JPLers who self-identify as Indigenous (Native American, Native Alaskan, Native Hawaiian, Indigenous to Mexico, South America, etc.), a number that fluctuates up or down with the comings and goings of interns.



(L to R): Powtawche Valerino, Mike Nieto, and Aaron Yazzie at a Native American Heritage booth on the Mall in 2011.

As NEBULA helps JPL reckon with its “origin story” and figure out how best to chart a positive path forward, Yazzie says he draws inspiration from this ancestral metaphor in his day-to-day work on Mars missions.

“When we’re studying Mars, we’re actually learning a lot about our own home planet — how it formed over 4 billion years or so — and we’re also trying to get these samples back to Earth so that we can study them and look for signs of ancient microbial life,” Yazzie says. “So we’re studying our origins as human beings and the origins of the land around us — how did we come to be in this world as humans? But also how do we come to be in this entire solar system in this universe? How did our planet come to form? So I’m finding that what I’m doing now is actually helping do what my ancestors have been doing forever — identify our origin story.”

Like the Kizh who observed the stars at Big Rock, Yazzie, Denson, and other Indigenous JPLers carry on the tradition of looking outwards — examining the frontiers of space and human knowledge. But, like the Navajo, they recognize the importance of also looking backward, because our origin stories inform who we are and where we might go.



Pinning Up the Lab’s Future

By Christian Hill

Standing on the steps of Building 180, Acting Chief Scientist Susan Owen took in the sea of knowledge displayed on the Mall for all to see: walls of posters displaying charts, graphs, and research – spanning additive manufacturing solutions, astrophysics breakthroughs, Earth Science opportunities, machine learning for autonomous robots, and much more – stemming from years of work from researchers across Lab.

“Next week is going to be the big holiday party on the Arroyo, but I like to think of today as our big research party,” Owen said to the large crowd of JPLers gathered under the big white tent. “This is really a celebration of all of the research that’s done at JPL.”

For the past 15 years, JPL’s annual Research Poster Day has been a long-cherished tradition for JPLers to share their research results with the broader JPL and Caltech community, shining a light on JPL’s research investment programs, Research and Technology Development (R&TD), and the Strategic Universities Research Partnership (SURP).

One hundred posters from JPL’s postdoctoral fellows were also on display, giving postdocs a chance to mingle with engineers and mission managers at JPL – a networking opportunity that could lead to collaborations and new ideas for JPL down the road.



*Acting Chief Scientist Susan Owen checks out some of the hardware displays on hand at the Research Poster Day. **Image Credit: PhotoLab***

New this year, the Research Poster Day included poster entries from JPL's Blue Sky Studies program — a type of think tank for the Lab focused on strategic development, future opportunities, and emerging marks that could revolutionize industries and significantly impact JPL. And lest anyone think the day's event only displayed paper, hardware and models coinciding with some of the posters were also on hand for participants to interact with.

Chief Technologist Tom Cwik recognizes the significant arc of this event over time: his days as a JPL researcher standing in front of the posters, then his years as a reviewer, and now the real-world applications in JPL's missions.

"You look back over the past years of research that's come out of these poster sessions, and you see pieces of technology used in the autonomous rovers known as CADRE that we're sending to the Moon in March next year," Cwik said. "That work was in these posters five, 10 years ago."

The single photon detectors aboard the Deep Space Optical Communication tech demonstration aboard the Psyche mission provide another example of poster research coming to life.

"I'm excited to walk around these posters today because I know I'm looking at the future," Cwik said. "What we're seeing on the posters today, in five to 10 years, they'll be in our mission set."

For Deputy Director Larry James, Research Poster Day remains one of his favorite days of the year at JPL, as it highlights the research and technology set to move the Lab into the future, and demonstrates the variety of research taking place at JPL.

"It's what makes us unique," James said in his opening remarks. "The diversity of research areas we operate includes advanced manufacturing design materials, AI machine learning, astronomy and fundamental physics, data science, navigation, detectors, sensors, instruments, EDL, in-space propulsion,

Earth science, modeling and simulation, robotics, solar science, and much more. That diversity is a strength of JPL. It's all of you who make that happen. You really poured your heart and soul into this research, and it's culminated here today where you can talk about what you have done. Enjoy that time."

JPL Family News

Retirees

The following JPL employees recently announced their retirements:

40+ Years:

Frank D. Kuykendall, Section 3190, 41 years

30+ Years:

Jayarao Balaram, Section 3471, 39 years

Thomas G. Davall, Section 252M, 34 years

10+ Years:

Joya L. Gorton, Section 1650, 13 years

Letters

I would like to thank JPL for the beautiful plant that was sent when my father passed recently. I also would like to thank my JPL colleagues for their kindness through the trying time. He was always inspired and awed by our projects, as well as proud of what we have accomplished. -Magdy Bareh

Passings

Passings must be submitted through Human Resources, which coordinates with the family of the deceased.

Following a long illness, **Lt. Col. Ed Bernard Massey** (USAF Ret.) passed away on November 13, 2023. He was 80 years old.

Ed Massey was a remarkable individual with a stellar work ethic and a high degree of personal and professional integrity. These qualities served him well as he built an extensive and impressive career in aerospace. Massey was a retiree from the Jet Propulsion Laboratory (JPL) where he was the Project Manager for both the NASA portion of the joint NASA/European Space Agency Ulysses Mission and the Voyager Interstellar Mission. Joining JPL in 1987, he served as Project Controller for Ulysses, Ulysses Science Instruments Manager, Ulysses Operations and Engineering Manager, and Ulysses NASA Project Manager. In 1998, when management of the Ulysses and Voyager projects were combined, Massey became manager of both projects.



Prior to JPL, Massey had extensive professional work experience in the United States Air Force space operations. Massey served from May 1983 to July 1986 as director of Space Test Operations in the U.S. Air Force Operational Test and Evaluation Center, assigned to the Los Angeles Air Force Base. Before that,

he served as deputy director from July 1982 to May 1983 of Systems Engineering and Integration in the Space Defense Systems Air Force Space Division, Los Angeles Air Force Base. Earlier in his military career, Massey held positions in missile data reduction and analysis as well as in satellite operations at a remote tracking station and in the Air Force Satellite Control Facility, operating the nation's highest priority space missions. He retired in 1986, having attained the rank of Lt. Colonel.

Massey was raised in the greater metropolitan area of Birmingham, Alabama. He graduated as valedictorian from Westfield High School, and attended Tuskegee University where he earned a Bachelor of Science in Electrical Engineering in 1966. Massey also earned a Master of Science in Systems Management from the University of Southern California in 1976. Always in the pursuit of additional learning, he completed the Air Force Squadron Officers School, Air Command and Staff College, Air War College, Program Manager's Course, Defense Systems Management College, and NASA's Management Education Program.

Massey was a member of the American Geophysical Union, the European Geosciences Union, the Military Officers Association of America, and the Air Force Association. In 1961, while at Tuskegee University, Massey was inducted into the Lambda Epsilon chapter of Omega Psi Phi Fraternity, Inc., an organization with which he remained active until his death. He was a founding member of the Alumni of Lambda Epsilon Foundation, and a member of the Zeta Tau graduate chapter in Pasadena, California, where he served as Keeper of Finance. He also served as the Treasurer of the Ernest E. Just Foundation and the Zeta Tau Foundation. In addition, Massey was also active in the California Chapter of the Westfield High School Alumni Association, which he served as its Vice-President and Treasurer. He was also an Eminent Associate of Tuskegee University and a member of the Los Angeles Chapter of the Tuskegee Alumni Association.

Massey is preceded in death by his wife of 48 years, Claudette. He is survived by his two adult daughters Joycelyn Massey and Kristel Robinson (Matthew), and two grandchildren.

It is with deep sorrow and heavy hearts that we announce the passing of **Dr. Zahidul Hasan Mushfiqur Rahman**, a brilliant rocket scientist whose contributions to space exploration have left an indelible mark on the world. Dr. Rahman, who dedicated his life to pushing the boundaries of space science, took his last breath on October 16, 2023. He was 67 years old.

Born in Jessore, Bangladesh, Dr. Rahman was the beloved son of Hamida Khatun and Abdur Rahman. Abdur Rahman was a trailblazer as the first Muslim post-graduate in Mathematics from Dhaka University in 1927. Dr. Zahidul Rahman inherited his father's spirit of intellectual pursuit and embarked on an extraordinary journey in the field of science and technology.



Dr. Rahman completed his undergraduate education at the prestigious Bangladesh University of Engineering and Technology (BUET), where he laid the foundation for his future endeavors. He pursued his passion for knowledge relentlessly, earning his PhD from Washington State University. Afterward, he continued his research as a post-doctorate fellow at Texas A&M University.

His professional journey led him to the NASA Jet Propulsion Laboratory (JPL), where he joined the ranks of top scientists and engineers advancing space science and technology for the next 31 years. Dr. Rahman's work with NASA was nothing short of remarkable, contributing to several groundbreaking space programs, including the Mars Rover.

While his professional accomplishments were remarkable, Dr. Rahman's family was his true passion and north star. He is survived by his loving wife, Rumana, his beloved daughter, Anika, his cherished son, Mehran, and their family dog, Cinnamon. Dr. Rahman's devotion to his family was as profound as his commitment to science, and his kindness, generosity, wisdom, and love were a guiding light for all who had the privilege of knowing him.

In addition to being a dedicated husband and father, Dr. Rahman was an avid traveler, with a passion for exploring the world, engaging in spirited discussions about politics, and spending quality time with his loved ones. He was a loving son, a supportive brother, a caring uncle, and a loyal friend to many. His presence in the lives of those who had the honor of sharing it was a source of inspiration and warmth.

-This obituary was written and submitted by the Rahman family.

Awards & Honors

JPLers often Dare Mighty Things, and nearly as often earn awards or professional designations. JPL Space periodically features a roundup of recent honorees. Please join us in congratulating your accomplished colleagues.

Nacer Chahat

Class of 2024 AIAA Associate Fellow

"For exceptional leadership and innovation in spacecraft antennas, telecommunication, and system engineering that have enabled NASA Earth science and planetary missions." [Award citation](#)

William Hart

Class of 2024 AIAA Associate Fellow

"For technical and leadership contributions in the development of advanced electric propulsion communications spacecraft and systems engineering leadership for NASA JPL missions." [Award citation](#)

Charles D. Norton

Class of 2024 AIAA Associate Fellow

"For outstanding leadership in small satellite technology and mission development, expanding NASA's portfolio in space science exploration." [Award citation](#)

Hemali Vyas

Class of 2024 AIAA Associate Fellow

"For potential use of Wi-Fi technologies on lunar surface for local communications and use of acquisition/tracking for predicting location and systems engineering leadership for NASA JPL missions." [Award citation](#)

MOXIE Team

TIME's Best Inventions of 2023

A list of 200 groundbreaking inventions (and 50 special mention inventions). [Award citation](#)

Goutam Chattopadhyay

Institute of Electrical and Electronics Engineers (IEEE) Microwave Theory & Technology Society

Elected as the President of the Institute of Electrical and Electronics Engineers (IEEE) Microwave Theory and Technology Society (MTT-S) for 2025. [Award citation](#)

Farah Alibay

Honorary Ph.D. (DSc) from the Gina Cody School of Engineering and Computer Science at Concordia University

"For being an inspirational role model in aerospace engineering." [Award citation](#)

Personnel Appointments

Star Tracks is a monthly series highlighting recent personnel appointments on Lab.

Elizabeth C. Cordoba: Deputy Section Manager of 3130 Spacecraft Systems Engineering and Behaviors on Oct. 9.

David C. Gruel: Group Supervisor of 314Z Integration, Test & Validation Staff on Oct. 9.

Matthew J. Hart: Section Manager of 3120 Project Systems Engineering & Formulation on Oct. 9.

Denise A. Hollert: Manager of 9260 DSN Aperture Enhancement on Oct. 9.

Jennifer M. Knight: Section Manager of 3550 Payload & Small Spacecraft Mechanical Engineering on Oct. 9.

Eric Larour: Section Manager of 3290 Earth Science on Oct. 9.

Tiago Stegun Vaquero: Group Supervisor of 397K Artificial Intelligence, Observation Planning and Analysis on Oct. 9

Thierry Caillat: Group Supervisor of 3464 Thermal Energy Conversion on Oct. 23.

Ronald Indradjaja: Group Supervisor of 512C HQA - Type 1 Projects on Oct. 23.

Jennifer L. Maxwell: Group Supervisor of 313A Solar Systems Flight System Systems Engineering on Oct. 23.